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ABSTRACT

The Junior High School Management Improvement Study (JMIS) was a field experiment conducted to verify and extend findings of previous research in English and mathematics classes. Using student behaviors (on task, off task, and disruptive behavior) as criteria of management effectiveness, this study investigated classroom management practices in 26 classes (part of the JMIS experiment) taught by 13 middle/junior high school teachers. Extensive classroom observations provided information about management practices associated with smooth-running, task-oriented classrooms. These include practices for general classroom procedures, managing student behavior, laboratory procedures, managing student assignments, presenting content, and structuring note-taking. Each of these practices are briefly described and illustrated. Since no information was available about student learning gains or attitudes toward science, there is no basis for assuming that practices of the better classroom managers constitute "good" science teaching. However, it is indicated that when teachers can establish orderly classroom environments and maintain students' cooperation, student engagement in appropriate learning tasks is more likely to occur. (JN)

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Management and Organization in Science Classrooms

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Management and Organization in Science Classrooms

Abstract

Twenty-six junior high and middle school science classes taught by 13 teachers were observed frequently during the first 2 months of school and during 2 months in the middle of the year to identify classroom management and instructional organization variables related to high levels of student task engagement and low levels of off task and disruptive behavior. A subsample of effective classroom managers was identified, and narrative data from their classes were analyzed to described and illustrate effective strategies for managing science classroom actvities.

Management and Organization in Science Classrooms

Most junior high school science teachers receive little or no preservice training to prepare them to teach students in the junior high or middle school age group (Hurd, 1981). Keeping large groups of students engaged in instruction that may require taking notes, following complex procedures, handling equipment, and/or working in groups challenges the classroom management skills of many teachers at that grade level, especially those who do not have much teaching experience. Several large-scale surveys have indicated that science teachers are concerned about classroom management and student discipline (Hurd, 1981; Stake & Easely, 1978). Many say they have difficulty managing laboratory activities and using "hands on" materials with students (Weiss, 1978). In addition, time spent on management of student behavior and on administrative and procedural functions can significantly reduce the amount of class time available for instruction in science (Nuccio, 1982; Stake & Easely, 1978). Previous research at the secondary school level has established relationships among teachers' management behaviors, student task engagement and cooperation with the teacher, and learning gains (Evertson & Emmer, 1982; McGarity & Butts, 1982; Newton & Capie, 1982; Stallings, Needles, & Stayrook, 1979).

This study extends previous classroom management research by examining management and organization in 26 classes taught by 13 science teachers in middle and junior high schools. Measures of student on task, off task, and disruptive behavior are used as criteria for management effectiveness. Based on about 25 observations of each teacher, classroom management and organization behaviors related to the student behavior criteria are identified, and management and organization

patterns in classes taught by more and less effective managers in the sample are compared.

The science classes included in this study were part of the Junior High School Management Improvement Study (JMIS) (Emmer, Sanford, Clements, & Martin, 1982). The JMIS was a field experiment conducted to verify and extend findings of previous research on classroom management in English and mathematics classes. A total of 61 teachers in a variety of subject areas in Grades 6 through 8 participated in the experimental study. All of the science classes in the JMIS form the sample for the present descriptive study.

Background

Research in the past 10 years has demonstrated links between teacher behaviors, student task engagement, and achievement (Borg, 1980; Emmer & Evertson, 1981; Evertson & Emmer, 1982; Frederick & Walberg, 1980; Good, 1982; Stallings, Needels, & Stayrook, 1979). Relatively few studies have examined classroom management variables in secondary science classes, however. A recent study by McGarity and Butts (1982) examined relationships among teacher classroom management competence, student engagement, and achievement in science classes. The authors used 12 variables taken from the Teacher Performance Assessment Instrument (Capie, Anderson, Johnson, & Elliott, 1979) to derive a classroom management competence factor. Results showed that teachers' management competence in general is related to both student engagement and science achievement.

A study by Newton and Capie (1982) examined relationships between different modes of student engagement and science process skill achievement. Significant relationships were found for six of 12 on task

categories. The four highest student classroom behavior correlates of process skill achievement were: engagement in planning (r = .53), generalizing (r = .37), collecting data (r = .35), and off task behavior (r = -.47). Teacher behaviors associated with differences in student engagement or off-task behavior were not a focus of the study.

One study that did examine teachers' management activities in science classes was conducted by Nuccio (1982). Using mean class time spent in instruction as the sole criterion of effective management, the author described more and less effective teachers' responses to various managerial events. Other studies have suggested that class time use is a relatively poor predictor of student achievement, compared to student engagement or teachers' management practices (Borg, 1980; Frederick & Walberg, 1980; Sanford & Evertson, 1983).

At the Research and Development Center for Teacher Education at the University of Texas, a series of studies of classroom management included a descriptive study of 102 junior high school English and mathematics classes (Emmer, 1981; Evertson & Emmer, 1982). In that study classroom observations began on the first day of school and continued throughout the school year. A variety of data were collected about each class, including descriptive classroom narratives, counts of student engagement, ratings of many teacher and student behaviors, and student achievement test scores. Effective and less effective teachers were identified, based on classroom management criteria (student engagement and freedom from disruptive and inappropriabe behavior) and student achievement test scores. Classroom narrative records and ratings of specific teacher behaviors were examined, contrasting effective and less effective groups of teachers, to find out what

effective teachers did that enabled them to establish well managed classes at the beginning of the year and maintain them throughout the year. The study identified several important areas of classroom management behavior. The effective teachers in the sample established and consistently used workable, comprehensive classroom procedures and rules, monitored student work and behavior closely, dealt with inappropriate behavior quickly and consistently, communicated directions and instruction clearly, and organized and paced instruction to meet the needs of students. While general patterns of effective management behaviors were the same in the two content areas, there were some content-related variations in classroom management and organization. Inclusion of a variety of content areas in the subsequent field experiment (the JMIS) based on the descriptive study provided an opportunity to examine effective management practices for classroom tasks and activities associated with different content areas.

Statement of the Problem

The present study of management in 26 junior high and middle school science classes was designed to answer the following questions:

1. What classroom management practices are related to high levels of student on task behavior and low levels of off task and disruptive behavior in science classes? To what extent are these teacher practices/student behavior relationships similar to or different from those in the JMIS sample as a whole?

2. What similarities and differences exist between management practices used by more and less effective managers in this sample with regard to (a) general classroom procedures and organization of activities; (b) conduct of laboratory (hands-on) activities and small

group work; (c) management of student assignments and keeping students responsible for their work; and (d) content presentations?

Method

Sample

All 26 of the science classes in the JMIS formed the sample for the present study. The 13 teachers were volunteers from two urban school districts in two southwestern cities. Table 1 shows the grade levels, course titles, years of teaching experience, and sex of the 13 teachers. Most were eighth grade teachers with fewer than 3 years of experience. Three were in their first year of teaching, while one teacher had 7 years of experience. All of the classes were heterogeneous or "average ability" classes.

Data Sources

Each teacher was observed in two classes beginning the first week of school and extending through February, with emphasis on the first 2 months of the school year. Between 16 and 18 observations were conducted during the first 8 weeks of school and eight additional observations were made during the month of January and February, making a total of about 25 observations per teacher. Observations extended through entire class meetings, and each teacher was observed regularly by at least two different observers. For four of the 13 science teachers, no observations were made during January and February, because three taught half-year courses and one left the school during the year.

A variety of data were collected on classes and teachers. Observers made narrative records or descriptions of classroom events and sequences of activities, recording as many direct quotes as possible. In addition, beginning at a randomly determined time during the first 10

minutes of each observation, and thereafter every 10 minutes, observers stopped taking notes for the narrative record and used the Student Engagement Rating (SER) form to record the number of students in the class who were engaged in academic or procedural activities or who were off task or in dead time. Five assessments were usually recorded during each observation. Subsequently, SER counts were converted to proportions of students in each category of engagement, and averages were calculated for each category across observations.

After each observation, Component Rating (CR) scales were used by the observer to assess teacher and student behavior on a number of variables. Component Ratings consisted of 54 variables describing classroom behaviors related to instructional management, room arrangement, rules and procedures, meeting student concerns, managing pupil behavior, disruptive and inappropriate student behavior, and classroom climate. In addition, seven Addendum Component Rating (AdCR) scales describing beginning school practices were used only during the first week of school.

Two other instruments assessing management behaviors were used to supplement the regular observation data. Observer ratings of teachers (ORTs) were summary ratings completed at the end of the first 8 weeks of observation to measure teaching behaviors and activities that might require several observations to assess. After data collection ended, an assessment form, Narrative Reader Ratings (NRRs), was used by readers of narratives to provide quantitative summaries of relevant management variables in addition to qualitative summaries and analyses of the narratives. For more complete descriptions of all of the instruments used in the JMIS and for the instruments themselves, readers are

directed to the full report of the JMIS (Emmer, Sanford, Clements, & Martin, 1982).

Reliability on classroom observation instruments was established during observer training using videotapes. During data collection, reliability checks were also made on 28 paired observations (two observers in a class simultaneously) and by examining intraclass correlations for teacher behavior variables across observations in weeks 2 through 8. These processes indicated that most of the observation variables were reliable at the .05 significance level, and those that were not were not used in analyses (Emmer, Sanford, Clements, & Martin, 1982).

Analysis

To answer Study Question 1, which examined relationships of science teacher management behaviors and student on task, off task, and disruptive behavior, partial correlations controlling for treatment or control group membership were computed between the student behavior criteria and teacher management behaviors derived from classroom observations and narrative analyses.

To describe and illustrate management and organization practices used by more and less effective teachers in the sample (Study Question 2), the 13 teachers were ranked on eight management effectiveness criteria. These criteria consisted of the three student behavior criteria used in Study Question 1, and five variables taken from the Component Rating (CR) instrument: CR 3b, appropriate general procedures; CR 1k, consistently enforces work standards; CR 5d, consistency in managing behavior; CR 1d, teacher gives clear directions; and CR 1h, appropriate pacing of the lesson. Because four of the

teachers were not observed during January and February, observation data from the first 2 months of school only were used in this analysis.

In identifying more and less effective classroom managers, the combination of eight criteria above was used because although the main criteria of management effectiveness in this study were student engagement and freedom from disruption, high correlations among individual management practices and these student behaviors do not preclude the possibility that individual teachers might have good student behavior in their classes but have weaknesses in one or two important aspects of management practice. Utilizing as additional criteria key variables in each of four major areas of management behavior (classroom procedures and rules, student work procedures, management of student behavior, and organizing and presenting instruction) resulted in the identification of a group of classes from which case studies and examples of workable procedures could be drawn with more confidence.

Narrative records of classroom observations for teachers were read and summarized. Qualitative analysis focused on the four general areas of management listed above. In addition, teacher summaries were prepared of any available information about three specific aspects: management of hands-on or laboratory activities, content presentation and student note taking, and management of longer term assignments such as research reports. Narrative records also provided information about time use and activity patterns in the 13 classes.

Results and Discussion

Management Variables and Student Behavior

Correlation of classroom management and instructional organization

variables with student behavior criteria identified a number of teacher practices significantly related to high levels of task engagement and freedom from disruption in science classes. Table 2 lists variables and correlation coefficients relating to each of four areas of management: classroom procedures and rules, student work procedures, management of student behavior, and organization and presentation of instruction. Table A in Appendix A shows summary descriptive statistics for all of the classroom management variables, which are 5-point scale ratings in which 5 indicates high incidence of the behavior and 1 indicates low or no incidence of the behavior.

Classroom procedures and rules. Procedural variables (Section I in Table 2) showing the strongest significant relationships with the effective management criteria in science classes include appropriate general procedures, efficient administrative routines, efficient opening and closing classroom routines, frequency of students calling out for teacher's assistance (negative), and effective small group procedures. Correlation coefficients for these variables range from $r = .68$ to .95. Managing interruptions efficiently, having procedures that enable students to get help without interrupting the teacher, and effective teaching of procedures and rules to students are also significantly related to one or more of the student behavior criteria. Using students as helpers for administrative and procedural jobs is not significantly related to management success.

Student work procedures. In the area of procedures governing student assignments (Section II in Table 2), strong significant correlations ($r = .69$ to .91) were obtained for several variables: consistently enforcing work standards, suitable routines for assigning,

checking, and collecting work, and effectively monitoring students' progress and completion of assignments.

Managing student behavior. In the area of managing student behavior (Section III in Table 2), key management variables identified by earlier management research (Emmer, 1981; Evertson & Emmer, 1982) and in the JMIS (Emmer, Sanford, Clements, & Martin, 1982) were supported by strong correlations with student behavior variables in science classes. Teachers' consistency in managing student behavior, effective monitoring, stopping inappropriate student behavior quickly, and avoidance of student wandering in the classroom all showed high significant correlations with the three management success criteria. Few significant correlations were obtained for any specific response to inappropriate or disruptive behavior, and variables relating to classroom consequences (rewards or punishment systems) showed no significant correlations, except for one very general variable, System of consequences is appropriate, sufficient, and effective. Teachers' expectations regarding student talk during seatwork appeared to be a significant factor associated with disruption and task engagement. Teachers in this sample varied greatly with regard to whether they permitted students to talk while they worked on individual assignments in class. Some generally expected students to be silent and work alone, some permitted quiet talk, and others allowed students to talk as much as they pleased without being very disruptive. Correlations suggest that permissive policies were associated with more off-task and disruptive behavior and lower levels of task engagement.

Organizing and presenting instruction. Another set of variables in this study (Section IV in Table 2) assessed teachers' behavior with

regard to organizing and pacing instructional activities and presenting information. Based on consistent significant correlations, the most important variables in this area are describing objectives clearly, clear directions, waiting for students' attention before giving directions, appropriate pacing of lessons, clear explanations and presentations, planning appropriate amounts of work for the class period, and efficient transitions. Correlation coefficients for these variables and the student behavior criteria range from .61 to .89. Results for three additional variables underscore the importance of pacing and accommodating student abilities and characteristics: student success rate, attention spans considered in lesson, and monitoring student understanding.

Miscellaneous variables. Finally, Section V of Table 2 shows that of the personal teacher characteristics assessed in this study the only one significantly related to student behavior is confidence. Enthusiasm, showmanship, warmth, listening skills, and distracting mannerisms appear to be unrelated to management success in this sample of 13 teachers. Classroom climate, as indicated by a relaxed and pleasant atmosphere, is negatively related to off-task and disruptive student behavior.

For the most part, the pattern of relationships found in science classes are similar to those reported for junior high classes in other content areas (Emmer, Sanford, Clements, & Martin, 1982; Evertson & Emmer, 1982). However, compared with correlations reported for the JMIS sample as a whole, differences in magnitude of correlations for some variables suggest that certain practices may be especially important in science classes. For example, in a similar analysis conducted with all

core academic teachers in the JMIS (n = 38), correlation coefficients with on task and disruptive student behavior, although significant, were 10 to 15 points lower than corresponding correlations in the present analysis on 12 key variables, including administrative routines and appropriate general procedures, effective monitoring, stopping inappropriate behavior quickly, student wandering, clear directions, explanations, and presentations, and appropriate pacing of lessons. Thus, there is some suggestion that in junior high and middle school science classes, compared to classes in other content areas, efficient procedures and routines for class, quickly stopping inappropriate behavior and wandering, clear communication, and appropriate pacing of instructional activities may be especially important. Considering the complexity of science class content and activities (at least in many classes, compared to mathematics, English and social studies) these differences in relationships seem reasonable.

Description of Management Practices

Ranking the 13 teachers on each of the eight effectiveness criteria listed in the methods section and summing ranks resulted in the identification of three distinct groupings: a group of three best managers, seven middle group teachers, and three low manager group teachers. Table 3 presents a comparison of means for the three subgroups of teachers for the eight management variables. Best group and low group teachers were consistently higher or lower than most teachers on most management variables. Teachers in the middle group can be characterized as generally competent managers. Mean scores for some were inconsistent across different aspects of management (e.g., high

means scores on on-task and classroom procedures, but less favorable scores for disruption, pacing, and clarity).

In the remainder of this paper, classroom procedures and activities in classes taught by more and less effective managers will be described and contrasted. Discussion will be organized around five important aspects of science classroom activity: general classroom procedures, time use and activities, laboratory and hands-on activities, student work procedures, and content presentation, including student note taking. The general objective will be to provide some concrete illustration of effective strategies in each area.

General classroom procedures. Of the three teachers in the best manager group, two used similar approaches to classroom management and procedures while one used a less structured but equally effective system. In classes taught by Teachers B 1 and B 2, classes began with a routine that required students to take their seats immediately on entering the room and begin copying the objectives and assignments for the day from the chalkboard. While students completed these routine tasks, the teachers handled administrative chores. In Teacher B 3's classes, students took their seats and waited quietly until the teacher completed roll check and began to give directions for the day. With the exception of some ambiguity in Teacher B 1's policies on student call outs and out-of-seat behavior, the three best teachers had procedures that effectively governed student talk, participation in oral lessons and discussion, getting out of seat, checking or turning in work, what to do when work was finished early, and ending the class. At the beginning of the school year, all three teachers clearly explained their expectations

for student behavior during class, and then followed their presentations with review and reminders of policy in subsequent weeks. In all three classes teachers gave clear, simple directions and were noted as excellent in structuring transitions. They kept students apprised of time left for an activity; they forewarned the class of up-coming transitions; they brought one activity to an end before beginning another. They also told students what materials would be needed for an activity, and had students get materials ready before beginning.

In the three best managers' classes, students were generally expected to work quietly when doing individual assignments and only brief whispered exchanges between students were permitted. During lab assignments and when students were assigned to work in pairs or groups, talk was allowed. The three best managers monitored student behavior closely, circulating around the room to look at students' work. Even when these teachers worked at their own desks, they were accurate in quickly spotting off-task students.

Consequence systems (e.g., demerits and detention after class or rewards for good behavior or work) were much more visible in classes of Teachers B 1 and B 2 than in classes taught by Teacher B 3. Teacher B 3 seldom used (or appeared to need) any kind of penalty with the exception of one mention of "points off," and he used no rewards other than grades. Teachers B 1 and B 2 used a system of demerits and detention after school consistently and fairly, although minor inappropriate behavior was usually stopped quickly by all three teachers by reminding students of what they were supposed to be doing, saying the student's

name, or asking for silence. These three teachers' manner in conducting class was task oriented, and businesslike, although congenial.

In contrast, in six classes taught by teachers in the low manager group, procedures and routines governing major areas of classroom life were frequently missing. For example, in classes taught by Teacher L 2 there were no routines established for beginning and ending the period, student talk during seatwork, getting help from the teacher, or what to do when work was finished. Teacher L 3 had procedures in place for some of these areas but not for others. Teacher L 1 announced at the beginning of the year very strict classroom behavior rules, but ignored these standards thereafter and often appeared to be relatively comfortable with a very permissive atmosphere in class. All three teachers were noted as making fairly clear (although not comprehensive) presentations of classroom procedures and rules at the beginning of the year, but they provided little or no review or reminders afterward. All three presented elaborate consequence systems which were seldom or never enforced. Two of the three poor managers were poor monitors of student behavior and work, often seeming unaware of whether students were doing their work or misbehaving. All three teachers had difficulty conducting transitions from one activity to another. They often did not bring one activity to an end before giving directions for another. They gave directions without getting students' attention, and they seldom forewarned the class or helped students structure their time.

Class time use and activities. Analysis of activity codes recorded on classroom narrative forms failed to show differences between more and less effective managers' classes with regard to total instructional time, when instructional time is defined as proportion of class time in

which the teacher and/or the majority of students are involved in an academic activity such as content presentation or discussion, seatwork, small group work, or testing. Table 4 shows that teachers varied widely with regard to proportion of class time in three different activities: whole class instruction (teacher presentation of content, discussion, recitation), student activities (students work independently or with other students on assigned academic tasks, including laboratory activities), and transition time. There was as much variation within groups as between, however. Two of the most effective managers had the lowest proportion of class time spent in whole class instruction. Students in their classes spent more time in individual or group tasks. This was not the pattern in the third more effective manager's classes, however. The middle group of managers had a lower group mean on student activities than the other two groups did, but this group included both the highest (.51) and lowest (.11) proportions in the sample. With regard to transition time, despite their poor control of student behavior the low manager group did not have a higher mean proportion of class time spent in transition. Time per transition may have been longer in these classes, but these teachers may have attempted fewer activities per class and so had fewer transitions.

Thus, proportion of class time spent in different activities does not appear to be a productive way to look at junior high classrooms (see also Sanford & Evertson, 1983). Total instructional time is a less important variable than appropriateness, pacing, and accountability of instructional activities and student engagement rates. The three best managers in this sample of science teachers were characterized as having a lot of work for students to do in class, and students were held

accountable for completing it. Activities in classes taught by Teachers B 1 and B 3 often included checking and discussion of completed assignments. The three best managers often planned several activity segments for each class meeting. The following synopsis of a narrative of one of Teacher B 3's class meetings illustrates several of these points.

> (The class had been introduced to the topic of chemical elements and the periodic chart of elements on the previous day.) The teacher begins class with 6 minutes of explanation about the elements and directions for completing a worksheet on the topic. Students listen and two ask questions, which the teacher answers thoroughly. Then the teacher gives students directions for two written tasks: complete the elements worksheet on their own and copy a list of elements and symbols from a transparency on the overhead projector. As soon as all students start work, Teacher B 3 calls eight students for instruction at the periodic chart. He spends about 5 minutes instructing students in this small group. When students working at their desks begin to talk he reminds the class to work alone on the worksheet, then he finishes his discussion with the small group and sends these students back to their desks. A second group is called for instruction at the periodic chart. Students move quickly to the teacher, who watches the transition while standing near the chart at the front of the room. When the teacher finishes instructing this group, he calls the remaining students in class for small group instruction at the periodic chart. The rest of the class continues work at their seats. When a little talk begins the teacher quickly stops it with a word or two. When small group instruction is finished, the teacher circulates around the room, helping students with their worksheet. Once he gets all of the students' attention for a brief review presentation on a point many students are having problems with. Then he returns to helping individuals. As some students begin to copy the list of elements and their symbols from the overhead screen, the teacher announces that there will be a quiz over these elements, their spelling, and symbols tomorrow. He tells students that after copying the list they should begin studying it. Fourteen minutes before the end of class he announces that students not finished with the worksheet should finish it at home and begin to work on their list of elements. He also announces that he will now begin to check the work of students who have finished the worksheet. At first he lets students come to his desk for checking, then he begins to circulate around the room to check work. Near the end of the period, many students are studying quietly in pairs, quizzing each other over the elements and symbols.

Laboratory Activities

Most teachers in this sample used hands-on or laboratory activities infrequently (probably less than once a week although observations may not have sampled these activities fairly). Two teachers in the middle group of managers used laboratory activities in about half of the observed class periods, discounting the first week of school. A few teachers' classes were never observed in such activities. Two teachers in the best manager group used such activities in about one fourth of observed classes after the first week; one was observed conducting hands-on activities only twice.

Narratives of class meetings with hands-on activities provided many illustrations of the difficulties that some teachers encounter in trying to conduct such activities. Laboratory activities conducted by poor managers were often characterized as chaotic, with very little work accomplished by students. Students often did not appear to listen to or follow teachers' instructions. Classes were very noisy and many students were rowdy. Teachers ignored most off-task and inappropriate behavior while trying to help individuals. In contrast, laboratory activities in classes taught by the three best managers usually ran smoothly and efficiently. These teachers defined the task clearly for students, prepared materials and established procedures that allowed students to work with a minimum of confusion and delay, and monitored students' work closely. Students appeared to be interested in the laboratory activities and able to complete their assignments successfully. They were orderly and talk was mostly task related. To illustrate the management practices that resulted in such good work environments, the procedures that Teacher B 2 used for laboratory activites are described below.

Students worked in pairs for most laboratory activities. Partner assignments were made by the teacher and were changed several times during the year. On the day of a lab (or sometimes on the day before) instructions for the lab were provided on a worksheet and on the chalkboard. The teacher went over objectives of the lesson, the grading criteria, and the procedures listed on the board and lab worksheet. If the laboratory activities consisted of several major parts, she suggested time allotments for each part to help students pace themselves. New words or terms used on the worksheet were defined. All of this information was listed on the blackboard or on an overhead transparency to save time. Materials were ready before students needed them. Two separate supply stations were often used to avoid congestion.

During laboratory activities, the teacher circulated around the room to check on students' work and answer questions. Students were expected to raise their hand if they needed help and stay at their work station unless it was necessary to get supplies. While students worked, the teacher gave several reminders about time, providing a 10-minute, a 5-minute, and a 2-minute warning before clean up. If students finished their work early, they were instructed to check over their worksheet to make sure it was complete and neat. If there was enough time they were to ask the teacher for more lab activity instructions. Otherwise they were to read the references listed for the day's lesson. The teacher allowed plenty of time for clean up (usually at least 5 minutes before the end of the period). To make sure the class did not run overtime she often set a kitchen timer. Immediately after clean up (but not before) the teacher had students return to their desks. She usually conducted a quick discussion of results and conclusions and gave them a report on their performance during the lab.

Student work procedures. In classes taught by more effective managers, there were very clear work requirements, good monitoring of student progress on assignments, and frequent checks of daily work and quizzes in class. One of the three teachers in the low manager group had adequate accountability procedures in place and tried to monitor student work. In classes taught by the other less effective managers, however, there were poor and inconsistent procedures for assigning, collecting, and checking work, and little monitoring of student progress or completion of assignments.

The beginning class routine used by two of the best managers helped students and teachers keep track of assignments. Students were held accountable for copying each day's assignment and schedule of activities into their notebooks. A permanent record of these "plan of the day" descriptions for each 6 weeks was also maintained on display in the room, so that students who were absent from class could assume responsibility for their own make-up work. In all three of the best managers' classrooms due dates for assignments were not routinely extended or ignored. Students were penalized in some way for late work.

Both from the teachers' and the students' points of view, one problematic aspect of work procedures at the junior high and middle school level is management of relatively long term assignments such as research papers or projects. Typically at least one such assignment is included in eighth-grade curriculum and it may have a large impact on students' grades for one grading period. While not enough information about such assignments was captured in JMIS narratives to allow a systematic comparison of procedures across many classes, the procedures used by one of the teachers in the best manager group provide an example of how science teachers working with junior high and middle school age students can structure long term assignments to help students succeed:

> For her eighth-grade students first research paper, Teacher B 2 assigned topics, rather than allow students to choose their own. An assigned topic made it easier for students to begin quickly and allowed the teacher to make some adjustments in the difficulty of assignments for different ability levels of students. When she introduced the research paper assignment, the teacher gave each student two handouts describing requirements. On one page was a description of the topic for the paper and some questions that the paper should address. The other handout outlined general requirements for the research paper, a calendar of check points, a due date for the assignment, and information about how the research

paper would be graded. When she distributed the handout Teacher B 2 went over all of the directions and requirements with the students. Standards described in detail included final appearance of the paper, type of folder for the report, procedures for corrections, number of references, number of written or typed pages, and form for compiling the bibliography. The check points for the project included an initial approval of the student's list of references and examination of the student's notes. At both check points students received credit toward daily assignments, and the teacher gave them feedback and suggestions. Teacher B 2 also provided students with examples of research papers from prior years for examination during class. She also indicated the days the class would be scheduled to work in the library. Before the written report was due, students received a check-off sheet that they used to determine whether they had met all of the requirements before turning in their reports. Before oral reports were given, the teacher distributed copies of the criteria she used for evaluating presentations and discussed them with the class.

Content presentations. In almost all of the classes in the sample, much science content was presented to students through means other than oral explanation (lecture) by the teacher. Often students read from a text or a handout, wrote answers to questions or definitions of terms, or completed some kind of worksheet. Class discussion focused on and reinforced content of these assignments. Frequency of oral content presentations in which students were expected to take notes ranged in this sample from two observations out of 24 to over half of the observations for several teachers. More effective and less effective managers were similar in that they usually helped students take notes during such presentations by writing essential facts on an overhead transparency or on the chalkboard. Good managers were different from less effective ones in that their presentations and explanations were clearer, their directions about notetaking were explicit and firm, and they held students accountable for notes that were supposed to have been taken. Less effective managers were more often vague about expectations for notetaking (e.g., "This is something you should maybe put down in

your notes.") and less likely to check students' notes. Several teachers in the best manager and middle manager groups had their students keep a note section in their notebook. Before a presentation they usually told students to get out the notebook, turn to the notes section, and date the paper. During presentations these teachers wrote down facts, sometimes in outline form, on an overhead transparency or on the chalkboard as they discussed points and questioned students. Students' notebooks were checked periodically.

In addition to telling students that in general they should copy everything written on the board, Teacher B 1 several times showed students an example of good notes taken by one of the students and pointed out good strategies used, such as underlining important words. When students were supposed to be copying notes, she waited long enough for them to finish before going on. On at least one occasion, this teacher circulated after a presentation and inspected students' notes while they were working on another assignment. Notebooks in this class were turned in for a major grade.

During content presentations, Teacher B 3 usually displayed notes on an overhead transparency. He often used a coversheet to reveal notes one paragraph or section at a time as he explained and elaborated on them. He continually checked for student understanding as he went along by questioning students and asking them to define terms used in the notes. On two different occasions he requested students to put their notes on the upper corner of their desk immediately following the presentation, and then he circulated around the room looking at these papers. When this teacher used a film for content presentation, he discussed the film before presentation, telling students what to look

for. Often he gave students specific questions to answer or terms to define from the film. Other times students were told to simply take notes or "write four facts" during the film. Immediately after the film, the teacher questioned students and discussed points they should have recorded in notes. Questions from films were checked in class or completed for homework.

Summary and Conclusion

Using student behaviors (on task, off task, and disruptive behavior) as criteria of management effectiveness, this study has investigated classroom management practices in 26 classes taught by 13 junior high and middle school teachers. Extensive classroom observation provided information about management practices associated with smooth running, task oriented classrooms. Effective management practices for general classroom procedures, managing student behavior, laboratory procedures, managing student assignments, presenting content, and structuring note taking were briefly described and illustrated.

In this study no information was available about student learning gains or attitudes towards science, and there is no basis for assuming that practices of the better classroom managers described in this paper constitute "good" science teaching. Maintaining student engagement and avoiding disruption are, of course, not the sole criteria of effective teaching in science, and optimum levels of these management indicators may vary with different kinds of learning objectives, different teachers, and different students. Newton and Capie (1982) have demonstrated that student achievement in specific kinds of learning objectives (such as science process skill) is related more directly to student engagement in specific kinds of learning experiences (e.g.,

planning, data collecting) than to on-task behavior in general. In this study, correlations among student behavior criteria and instructional variables relating to clarity and pacing suggest close relationship between some important aspects of good instruction and teachers' management skills. In addition, based on previous research (Emmer, 1981; Evertson & Emmer, 1982; McGarity & Butts, 1982) some inferences and extrapolations about probability of some kind of achievement gains in better managed classes can be made. When teachers can establish orderly classroom environments and maintain students' cooperation, student engagement in appropriate and sufficient learning tasks is more likely to occur.

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Table 1

Characteristics of Teachers in the Science Sample

T. No.	Grade	Course Title	Years Teaching	Sex
04	8	Life/Environmental	7	F
10	8	Life/Environmental	3	F
20	8	Life/Environmental	1	F
28	8	Earth/Life	2	F
34	8	Environmental Science	0	M
35	8	Earth Science	1	F
39	8	Earth Science	2	M
43	7	Life Science	0	F
44	8	Earth Science	2	F
45	8	Earth Science	0	F
49	6	Physical Science	2	F
54	8	Earth Science	0	M
62	8	Earth Science	2	F

Table 2

Correlation of Classroom Management and Instructional Organization Practices with Student Behaviors

Variable Description	Off-task	On-task	Disruptive Behavior
I. CLASSROOM PROCEDURES AND RULES			
Efficient administrative routines (CR3a)	-.87	.81	-.85
Appropriate general procedures (CR3b)	-.95	.76	-.92
Efficient small group procedures (CR3c)	-.83	.46	-.64
Efficient opening and closing routines (CR3e)	-.87	.61	-.85
Manages interruptions (CR9d)	-.57	.56	-.55
How often are come ups observed while teacher is engaged with others (ORT7)	.58	-.61	.39

Note - CR = Component Ratings; AdCR = First Week Addendum Component Ratings; ORT = Summary Observer Ratings of Teachers; NRR = Narrative Reader Ratings

A single underscore indicates $p \leq .05$, and a double underscore indicates $p \leq .01$.

n = 13 teachers

Table 2 (continued)

Variable Description	Off-task	On-task	Disruptive Behavior
I. CLASSROOM PROCEDURES AND RULES (continued)			
How often students approach Teacher when need help (ORT11)	.58	-.49	.39
How often do students raise hands when need help from Teacher (ORT12)	-.59	.66	-.39
How often do students call out when they need help (ORT13)	.89	-.68	.76
Teacher uses students as helpers for administrative and procedural jobs (NRR2)	-.15	-.31	-.14
Procedures and rules are well taught (NRR9)	-.59	.12	-.53
II. STUDENT WORK PROCEDURES			
Consistently enforces work standards (CR1k)	-.91	.73	-.89
Suitable routines for assigning, checking, and collecting work (CR3d)	-.88	.74	-.81
How successfully does teacher hold students accountable for work (ORT24)	-.68	.46	-.49

Table 2 (continued)

Variable Description	Off-task	On-task	Disruptive Behavior
II. STUDENT WORK PROCEDURES (continued)			
Effective routines for communicating assignments (ORT25)	-.74	.47	-.65
Type of academic feedback: grades on papers (ORT28)	.13	.54	.17
Type of academic feedback: papers on bulletin boards (ORT29)	-.05	.15	.16
Type of academic feedback: citing students in front of class (ORT30)	-.18	-.11	-.11
Type of academic feedback: individual conferences with teacher (ORT31)	-.37	-.18	-.33
Type of academic feedback: evaluative comments to class as whole (ORT32)	.27	-.70	.31
Regular academic feedback to students (NRR3)	.05	-.05	-.02
Work requirements are clear (NRR4)	-.41	.53	-.28
Deadlines are enforced consistently (NRR5)	-.47	.11	-.41
Consistent routines for communicating assignments to students (NRR6)	-.15	.15	-.08

Table 2 (continued)

Variable Description	Off-task	On-task	Disruptive Behavior
II. STUDENT WORK PROCEDURES (continued)			
Effectively monitors students' progress and completion of assignments (NRR7)	-.76	.51	-.69
Regular, efficient routines for checking, turning in, and grading work (NRR8)	-.44	.50	-.48
Teacher clearly ties class activities to grading system (NRR14)	-.29	.32	-.20
III. MANAGING STUDENT BEHAVIOR			
Rewards appropriate behavior (CR5b)	-.10	-.40	-.16
Consistency in managing behavior ((CR5d)	-.94	.73	-.89
Effective monitoring (CR5e)	-.92	.67	-.84
Cites rules or procedures to stop disruption (CR6d)	.13	-.42	.26
Uses desist statements to stop disruptions (CR6f)	.44	-.52	.43
Uses penalties to stop disruptions (CR6h)	.38	-.69	.35

Table 2 (continued)

Variable Description	Off-task	On-task	Disruptive Behavior
III. MANAGING STUDENT BEHAVIOR (continued)			
Stops inappropriate behavior quickly (CR7c)	**-.95**	**.73**	**-.94**
Cites rules or procedures to stop inappropriate behavior (CR7d)	.05	-.55	.16
Uses desist statements to stop inappropriate behavior (CR7f)	.40	-.43	**.60**
Ignores inappropriate behavior (CR7i)	**.82**	**-.62**	**.78**
Criticizes to stop inappropriate behavior (CR7g)	.11	-.21	.16
Uses penalties to stop inappropriate behavior (CR7h)	.32	**-.65**	.22
How often does wandering occur that is not task related (ORT3)	**.93**	**-.83**	**.86**
What is teacher's expectation regarding talk during seatwork (ORT5)	**.90**	**-.80**	**.73**
Rewards or positive consequences for appropriate behavior are clearly defined (NRR10)	.04	-.55	-.03
Rewards or positive consequences are used consistently (NRR11)	-.36	-.27	-.37

Table 2 (continued)

Variable Description	Off-task	On-task	Disruptive Behavior
III. MANAGING STUDENT BEHAVIOR (continued)			
Negative consequences are clearly defined (NRR12)	.05	-.06	.25
Teacher follows through with negative consequences consistently (NRR13)	-.31	.09	-.28
System of consequences is appropriate, sufficient, and effective (NRR15)	-.70	.38	-.66
Teacher monitors at the beginning of activities (NRR16)	-.55	.30	-.42
IV. ORGANIZING AND PRESENTING INSTRUCTION			
Describes objectives clearly (CR1a)	-.75	.67	-.76
Variety of materials (CR1b)	-.30	.30	-.34
Materials are ready (CR1c)	-.54	.62	-.54
Clear directions (CR1d)	-.81	.77	-.84
Teacher waits for attention (CR1e)	-.92	-.67	-.92
Encourages analysis/builds reasoning skills (CR1f)	-.53	.20	-.48
Assignments and activities for different students (CR1g)	-.34	-.13	-.39

Table 2 (continued)

Variable Description	Off-task	On-task	Disruptive Behavior
IV. ORGANIZING AND PRESENTING INSTRUCTION (continued)			
Appropriate pacing of lessons (CR1h)	-.82	.78	-.78
Clear explanations and presentations (CR1i)	-.85	.67	-.78
Monitors student understanding (CR1j)	-.54	.34	-.58
Student success (CR4a)	-.66	.56	-.60
Attention spans considered in lesson (CR4c)	-.69	.44	-.64
Activities related to student interests and backgrounds (CR4d)	-.29	-.07	-.28
Conveys value of curriculum (CR8a)	-.70	.34	-.66
What is the efficiency of transitions (ORT6)	-.89	.72	-.84
Does teacher consistently plan enough work for students (ORT18)	-.84	.61	.80
How often does teacher allow activities to continue too long (ORT20)	.78	-.73	.65
Are typical assignments too short or easy (ORT21)	.82	-.79	.76

Table 2 (continued)

Variable Description	Off-task	On-task	Disruptive Behavior
IV. ORGANIZING AND PRESENTING INSTRUCTION (continued)			
Effective conduct of transitions (NRR17)	-.68	.52	-.65
Needs of highest and lowest ability students are not being met (NRR21)	.45	-.26	.31
Frequency of digressions, irrelevant comments, and sustained interruptions during instruction (NRR22)	.40	-.08	.42
V. MISCELLANEOUS			
Class has relaxed, pleasant atmosphere (CR8c)	-.70	.46	-.81
Teacher has distracting mannerisms (CR9a)	-.13	.13	.15
Teacher displays listening skills (CR9b)	-.21	-.05	-.21
How confident is this teacher (ORT34)	-.78	.68	-.75
How warm and pleasant was teacher's manner toward children (ORT35)	-.27	-.04	-.42
How enthusiastic is this teacher (ORT36)	-.36	.10	-.31
What kind of showmanship does this teacher display (ORT37)	-.39	-.04	-.40

Table 3

Comparison of Means for Three Sub-groups

of Teachers on Eight Effectiveness Criteria

Variable	Best Group (n = 3)	Middle Group (n = 7)	Low Group (n = 3)	Range, All Teachers (n = 13)
Percent students off task, unsanctioned	2%	4%	13%	1%-18%
Percent students on task	94%	87%	80%	77%-96%
Disruptive student behavior*	1.11	1.39	2.48	1.00-3.18
Appropriate general procedures (CR3b)*	4.55	3.79	2.36	1.71-4.60
Consistently enforces work standards (CR1k)*	4.20	3.42	1.98	1.53-4.33
Consistency in managing behavior (CR5d)*	4.36	3.44	1.96	1.47-4.53
Clear directions (CR1d)*	4.36	3.90	3.00	2.65-4.50
Appropriate pacing of lessons (CR1h)*	4.33	3.62	2.54	2.38-4.50

*Ratings based on 1-5 scale

Note: Means based on 16-18 observations during 8 weeks in the fall.

Table 4

Class Time Use: Proportion of Class Time in Three Activities

	Best Managers				Mid Managers								Low Managers				All Te
Activity	B1	B2	B3	Mean	M1	M2	M3	M4	M5	M6	M7	Mean	L1	L2	L3	Mean	Mean
Whole Class Instruction*	.18	.14	.32	.213	.31	.31	.31	.37	.27	.40	.37	.334	.33	.39	.32	.347	.309
Student Activities*	.34	.46	.28	.360	.34	.51	.29	.22	.11	.20	.16	.261	.35	.24	.26	.283	.289
Transitions	.04	.05	.04	.043	.05	.05	.08	.04	.05	.03	.07	.053	.08	.04	.03	.050	.050

*Academic focus only

Note: Mean proportions based on approximately 22 observations per teacher from the second week of school through February.

APPENDIX A

Table A

Classroom Management and Instructional Organization Variables in Classes of 13 Science Teachers

Table A

Classroom Management and Instructional Organization Variables

in Classes of 13 Science Teachers

Variable Description	Mean	Sigma	Range
I. CLASSROOM PROCEDURES AND RULES			
Waits for attention (CR1e)	3.51	.78	1.65-4.38
Efficient administrative routines (CR3a)	4.01	.63	2.94-4.80
Appropriate general procedures (CR3b)	3.70	.84	1.71-4.65
Efficient small group procedures (CR3c)	3.96	.96	2.00-5.00
Efficient opening and closing routines (CR3e)	3.30	.78	1.65-4.31
Manages interruptions (CR9d)	4.06	.52	3.44-4.73
Teacher presents, reviews, or discusses rules and procedures (AdCR1)	3.28	.79	2.00-5.00
Presentation of rules, procedures and penalties is clear (AdCR2)	3.87	.91	2.00-5.00
Rationale for rules and procedures is explained (AdCR3)	3.01	1.20	1.00-5.00
Presentation of rules and procedures includes rehearsal or practice (AdCR4)	1.79	.96	1.00-4.33
Teacher provides feedback or review of rules and procedures (AdCR5)	2.60	.94	1.50-5.00
Teacher stays in charge of all students (AdCR6)	4.29	.51	3.33-5.00
How often are come ups observed while Teacher is engaged with others (ORT7)	2.30	.96	1.00-4.50

Note - CR = Component Ratings; AdCR = First Week Addendum Component Ratings; ORT = Summary Observer Ratings of Teachers; NRR = Narrative Reader Ratings

Table A (continued)

Variable Description	Mean	Sigma	Range
I. CLASSROOM PROCEDURES AND RULES (continued)			
How often students approach Teacher when need help (ORT11)	2.88	.79	1.80-4.50
How often do students raise hands when need help from Teacher (ORT12)	3.32	.54	2.00-4.25
How often do students call out when they need help (ORT13)	2.72	.98	1.75-5.00
Teacher uses students as helpers for administrative and procedural jobs (NRR2)	2.46	.84	1.50-4.50
Procedures and rules are well taught (NRR9)	3.50	.73	2.50-5.00
Frequent problems with students not bringing material to class (NRR18)	1.81	.54	1.00-3.00
Frequent problems with use of materials, supplies, and equipment in class (NRR19)	1.85	.60	1.00-3.00
Problems with beginning class procedures (NRR23)	2.54	.99	1.00-4.00
Problems with tardiness procedures (NRR24)	2.00	.83	1.00-4.00
Problems with students leaving room (NRR25)	1.69	.50	1.00-2.50
Problems with ending-class procedures (NRR26)	2.27	.75	1.00-4.00
Problems with student talk during whole class seatwork activities (NRR27)	3.31	1.03	2.00-5.00
Problems with response/questions during whole class seatwork activities (NRR28)	2.88	.94	1.50-4.50

Table A (continued)

Variable Description	Mean	Sigma	Range
I. CLASSROOM PROCEDURES AND RULES (continued)			
Problems with students out of seat during whole class/seat-work activities (NRR29)	2.69	.69	1.50-4.00
Problems with students after completing work during whole class/seatwork activities (NRR30)	2.81	.82	2.00-4.50
II. STUDENT WORK PROCEDURES			
Monitors student understanding (CR1j)	3.37	.46	2.40-4.31
Consistently enforces work standards (CR1k)	3.35	.84	1.53-4.38
Suitable routines for assigning, checking, and collecting work (CR3d)	4.14	.41	3.28-4.67
How successfully does Teacher hold students accountable for work (ORT24)	3.78	.81	2.50-5.00
Effective routines for communicating assignments (ORT25)	3.96	.73	2.50-5.00
Type of academic feedback: grades on papers (ORT28)	2.95	.56	1.80-3.75
Type of academic feedback: papers on bulletin boards (ORT29)	1.47	.54	1.00-2.75
Type of academic feedback: citing students in front of class (ORT30)	1.85	.57	1.00-3.33
Type of academic feedback: individual conferences with Teacher (ORT31)	1.83	.80	1.00-3.67
Type of academic feedback: evaluative comments to class as whole (ORT32)	3.06	.74	1.25-4.33
Regular academic feedback to students (NRR3)	2.88	.62	1.50-3.50

Table A (continued)

Variable Description	Mean	Sigma	Range
II. STUDENT WORK PROCEDURES (continued)			
Work requirements are clear (NRR4)	3.50	.55	2.50-4.50
Deadlines are enforced consistently (NRR5)	3.42	.62	2.50-4.50
Consistent routines for communicating assignments to students (NRR6)	3.65	.66	2.50-5.00
Effectively monitors students' progress and completion of assignments (NRR7)	3.23	.58	2.00-4.00
Regular, efficient routines for checking, turning in, and grading work (NRR8)	3.58	.76	2.50-5.00
Teacher clearly ties class activities to grading system (NRR14)	3.35	.63	2.00-4.50
Teacher monitors at the beginning of activities (NRR16)	3.15	.57	2.00-4.00
III. MANAGING STUDENT BEHAVIOR			
Rewards appropriate behavior (CR5b)	2.07	.86	1.23-4.50
Consistency in managing behavior ((CR5d)	3.38	.88	1.47-4.46
Effective monitoring (CR5e)	3.47	.75	1.88-4.52
Amount of disruption (CR6a)	1.61	.61	1.00-3.18
Cites rules or procedures to stop disruption (CR6d)	2.18	.89	1.00-4.00
Uses desist statements to stop disruptions (CR6f)	3.22	.65	2.00-4.13
Amount of inappropriate behavior (CR7a)	2.48	.78	1.69-4.24
Stops inappropriate behavior quickly (CR7c)	3.49	.91	1.47-4.70

Table A (continued)

Variable Description	Mean	Sigma	Range
III. MANAGING STUDENT BEHAVIOR (continued)			
Cites rules or procedures to stop inappropriate behavior (CR7d)	2.12	.66	1.12-3.81
Uses desist statements to stop inappropriate behavior (CR7f)	3.05	.43	2.24-3.73
Ignores inappropriate behavior (CR7i)	2.79	.83	1.26-4.41
Avoidance behavior during seatwork (CR9e)	2.22	.94	2.33-4.40
Restrictions on student discretionary behaviors (CR5a)	3.15	.64	1.71-4.13
Uses penalties to stop disruptions (CR6h)	2.09	.80	1.00-4.13
Criticizes to stop inappropriate behavior (CR7g)	1.23	.30	1.04-2.12
Uses penalties to stop inappropriate behavior (CR7h)	1.51	.54	1.08-3.08
How often does teacher let class get out of hand (ORT2)	2.36	1.31	1.00-5.00
How often does wandering occur that is not task related (ORT3)	2.06	1.09	1.00-4.50
What is the noise level of the classroom in general (ORT4)	2.70	1.17	1.25-5.00
What is teacher's expectation regarding talk during seatwork (ORT5)	3.08	.98	1.75-5.00
How well does teacher handle disruptions (ORT15)	3.73	1.15	1.50-5.00
Rewards or positive consequences for appropriate behavior are clearly defined (NRR10)	1.77	.99	1.00-4.50
Rewards or positive consequences are used consistently (NRR11)	1.92	.90	1.00-4.50

Table A (continued)

Variable Description	Mean	Sigma	Range
III. MANAGING STUDENT BEHAVIOR (continued)			
Negative consequences are clearly defined (NRR12)	3.12	.90	1.00-4.50
Teacher follows through with negative consequences consistently (NRR13)	2.62	.98	1.00-4.50
System of consequences is appropriate, sufficient, and effective (NRR15)	2.81	1.17	1.00-4.50
IV. ORGANIZING AND PRESENTING INSTRUCTION			
Describes objectives clearly (CR1a)	3.30	.61	2.08-4.17
Clear directions (CR1d)	3.91	.55	2.80-4.54
Appropriate pacing of lessons (CR1h)	3.62	.64	2.38-4.54
Clear explanations and presentations (CR1i)	3.76	.53	2.91-4.47
Student success (CR4a)	3.99	.54	2.80-4.88
Attention spans considered in lesson (CR4c)	3.47	.68	2.56-4.56
Materials are ready (CR1c)	4.48	.38	3.36-4.96
Assignments and activities for different students (CR1g)	1.32	.26	1.04-2.13
Variety of materials (CR1b)	2.12	.58	1.08-3.38
Encourages analysis/builds reasoning skills (CR1f)	2.90	.45	2.28-3.69
Activities related to student interests and backgrounds (CR4d)	2.73	.58	1.92-4.25
Conveys value of curriculum (CR8a)	2.86	.65	1.62-3.92
Participation in discussion and recitation (CR9f)	3.25	.60	2.45-4.62
What is the efficiency of transitions (ORT6)	3.73	1.10	1.50-5.00

Table A (continued)

Variable Description	Mean	Sigma	Range
IV. ORGANIZING AND PRESENTING INSTRUCTION (continued)			
Does teacher consistently plan enough work for students (ORT18)	3.97	.81	2.50-5.00
How often does teacher allow activities to continue too long (ORT20)	2.33	.93	1.25-4.50
Are typical assignments too short or easy (ORT21)	1.81	.81	1.00-4.00
When giving instructions, does teacher question students (ORT23)	3.35	.53	2.50-4.00
Effective conduct of transitions (NRR17)	3.27	.70	2.00-4.00
Needs of highest and lowest ability students are not being met (NRR21)	2.15	.66	1.00-3.50
Frequency of digressions, irrelevant comments, and sustained interruptions during instruction (NRR22)	1.69	.54	1.00-3.00
V. MISCELLANEOUS			
Class has relaxed, pleasant atmosphere (CR8c)	3.68	.69	2.76-4.63
Teacher has distracting mannerisms (CR9a)	1.07	.09	1.00-1.24
Teacher displays listening skills (CR9b)	3.45	.48	2.77-4.25
How confident is this teacher (ORT 34)	3.82	1.07	1.50-5.00
How warm and pleasant was teacher's manner toward children (ORT35)	3.48	.79	2.50-4.80
How enthusiastic is this teacher (ORT36)	3.29	.79	2.00-5.00
What kind of showmanship does this teacher display (ORT37)	2.44	1.00	1.00-5.00